Ask Jon Eakes

WHAT FACTORS CAN MAKE BETTER BASEMENTS?

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The three fundamental cures for basement problems are: removing the water from the outside, using granular back fill or a drainage layer against the foundation wall and insulating on the outside of the basement. Any one could stop or prevent a problem, all three of them together is the best way to build a house.-- To prevent water leaking into the basement, first ensure that rain gutters and landscaping do not funnel water toward the house. Basement walls should be damp-proofed on the outside at the time of construction or anytime you have to dig around the basement. But damp-proofing only resists water flow and true "water proofing" is expensive and difficult to achieve and maintain. If you have a problem and cannot get to the outside of the basement wall, you could coat the inside with a waterproofing concrete sealer, it stops the water from getting into the house but leaves the concrete saturated and open to potential freezing problems. If you use a more expensive sealer like Xypex, this will, over the course of several years, actually waterproof the wall all the way through by growing crystals to fill the pores of the concrete. But if the wall shifts and cracks again, the waiting water will still come in. If you have the courage to undertake the expensive job of digging down to the foundation, weeping tiles should be repaired or installed to help reduce the water pressure on the wall, regardless of which damp proofing or water proofing techniques you use on the outside of the wall.-- If you do dig down around the basement, you should fill the hole with granular back fill, not the original dirt you dug out. Granular fill serves two important functions: it allows water to drain quickly to the weeping tiles and it does not permit the capillary action which causes ice lenses to develop -- hence no ad-freezing. Now despite our knowledge that this solves basement problems, few people do it because the backfill is expensive and you have to get rid of the original, usually very poor quality soil that you dug out. So today we have things called drainage layers -- either insulation with drainage characteristics, or air gap membranes. The air gap membrane looks like a plastic sheet with little egg carton indentations. This provides an air space between the soil and the wall so that if any water gets into this area, it will simply drop to the bottom and drain away with no water pressure on the wall. They work exceptionally well. However, without functioning weeping tiles, drainage layers of any kind could collect lots of water and form a crushing ice block. As well, top soils should be more dense than the fill lower down to act a bit like an umbrella and insure better passage of water through the area than into it.-- Exterior insulation leaves the earth just as cold as interior insulation does, but it keeps the basement wall warm. Insulation generally presents a flexible and slippery surface to the dirt (or plastic can be added for this purpose) preventing ice lenses from grabbing hold. Exterior insulation, with either a drainage function incorporated into the insulation or an air gap membrane added over the top, is the best way to build a basement.

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